

REMARKS:

Claim 20 is amended; a marked up version of the amended claim is attached hereto pursuant to 37 C.F.R. § 1.121(c)(ii). Claims 17 and 20-21 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claims 17 and 20-21 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. Specifically, the Office asserts that the claims recite a tool with crystal planes without the recitation of any tool structure in the claims. The Office further states that it is not clear "as whether applicant is intended to claim a tool such a cleaving knife made with sapphire having monocrystal structure in the claims." The Office further states that "the claims fail to limit the structure of the semiconductor laser diode as recited in the specification of the invention, which renders the claims confusing, vague and indefinite."

Applicant respectfully traverses the rejection. One aspect of the present invention as described in Applicant specifications is directed to a sapphire substrate and a sapphire tool. (See e.g. Applicant's Specification, at p. 9, lines 3-12 and p. 14, lines 6-21). As described in Applicant's Specification, the sapphire tool may be used as a cutter, tape cleaner or the like. The monocrystal sapphire substrate of the present invention may suitably be used as a substrate in laser diode. (See Applicant's Specification, at p. 16, lines 4-10). Thus, claims 17 and 20-21 are drawn to inventive sapphire tools and monocrystal bodies.

Applicant notes that on September 1, 2000, the Office issued a restriction requirement in the above case, identifying two groups of claims: (I) Claims 17 and 20-21, drawn to a sapphire monocrystal body, classified in class 428, subclass 446; and (II) Claims 18-19, drawn to a semiconductor laser diode device, classified in class 373, subclass 45. In response to the restriction requirement, applicant elected the claims of group I, drawn to a sapphire monocrystal body, classified in class 428, subclass 446. Since that election, prosecution on the merits has proceeded with

respect to these inventive aspects of Applicant's invention. As such, contrary to the Office's assertion, the failure of claims to limit semiconductor laser diode structure does not render "confusing, vague and indefinite." The claims directed to the semiconductor laser diode are not currently being prosecuted. The Office has heretofore consistently understood that prosecution was proceeding with claims directed a sapphire monocrystal body.

Further, the Office's assertion that the claims are written "without the recitation of any tool structure in the claims" is simply incorrect. Claim 17 is directed to a tool comprising a "sapphire monocrystal body having at least two faces defining a sharp edge." These are clearly structural components of the claim. Further, the faces are formed along or in parallel to specific crystal planes in the monocrystal structure as follows, "one face formed by a working plane and a second face formed by a cleavage plane parallel to a plane R of the sapphire monocrystal, the angle between the working plane and the cleavage plane being less than about 70 degrees." Claim 17 thus particularly points out and distinctly claims the subject matter which applicant regards as his invention. The claim is neither vague, confusing nor indefinite. Withdrawal of the rejection is respectfully requested.

Claim 20 has been amended to eliminate a problem with antecedent basis and to eliminate the Office's apparent confusion. Amended Claims 20 and 21 recite clear and definite structural elements. In claim 20 and 21, the sapphire monocrystal substrate is defined as a "sapphire monocrystal" having the structural elements of "major face" and very specifically placed "microcrack" in the sapphire monocrystal. Applicant respectfully submits that claims 20 and 21 are clear, definite and specifically point out and distinctly claim the subject matter applicant regards as his invention. Withdrawal of the rejection is respectfully requested.

Claims 17 and 20-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Regler et al. (U.S. Patent No. 4,161,167). Claim 20 has been amended. Applicant respectfully traverses the rejection as to the amended claims.

Regler et al. is directed to lap cutting blades which are useable for the multiple lap cutting of solid materials, such as semiconductor rods. (Regler et al.,

Abstract.) The blades each have a generally rectilinear cutting edge, the length of which is 1-75 times the thickness of the blade, as measured at its cutting edge.

(Regler et al., Abstract.) The cutting edge of each blade has rectilinear edge portions separated by a plurality of notched edge portions which, in turn, define a plurality of recesses which encompass 5 to 25% of the total blade length and 5 to 40% of the effective operating length of the blade. (Regler et al., Abstract.) The notched blade edge portions define a notch angle of between 20 and 80 degrees, as measured between the tangent thereto at its point of intersection with the rectilinear cutting edge portion and a line perpendicular to the rectilinear cutting edge portion. (Regler et al., Abstract.) In Regler et al., the blades are made of Low cost types of steel are available for the blade material, for example, spring steel having a tensile strength of about 120 to 250 kp per mm², preferably, 200 to 240 kp per mm². It is to be understood that the free operating length of the blade means the blade portion which is freely clamped between the retaining elements and which is moved through the material to be cut. Thereby, the height of the blade is about 5 to 10 mm, particularly favorable is the dimension of about 5-7 mm having a thickness of about 100-300 μ m. (Regler, at col. 2, 42-44).

Conversely, claim 17 is directed to a tool comprising "a sapphire monocrystal body having at least two faces defining a sharp edge, one face formed by a working plane and a second face formed by a cleavage plane parallel to a plane R of the sapphire monocrystal, the angle between the working plane and the cleavage plane being less than about 70 degrees." Nothing in Regler et al. either teaches or suggests a tool, or a blade, made of a sapphire monocrystal body. Further, nothing in Regler either teaches or suggests one face of the tool is "formed by a working plane" and the "second face formed by a cleavage plane parallel to a plane R of the sapphire monocrystal" as is required by claim 17. Withdrawal of the rejection and allowance of claim 17 is respectfully requested.

Claim 20 requires, "a sapphire monocrystal having a major face.... and a microcrack line on the major face parallel to the plane R." Regler et al. is directed to steel lap cutters. Nothing in Regler et al. teaches or suggests a monocrystal

sapphire with a microcrack on the major face parallel to the plane R. as is required by claim 20. Since Regler et al. fails to teach or suggest each claim limitation, Regler et al. cannot anticipate claim 20, and claim 20 patentably distinguishes over Regler. Withdrawal of the rejection is respectfully requested.

Claims 17 and 20-21 stand rejected under 35 U.S.C. § 102(b) as having been anticipated by Kato et al. (U.S. Patent No. 4,662,124). The Office argues, "Kato shows in Figures 3 and 10 a sapphire monocrystal plate having a major face, an R plane, and C planes with an inclination angle less than about 70 degrees as required by the claims." (Office action, page 3, last two lines of page.). Applicant respectfully submits that Kato fails to teach several critical elements of claims 17 and 20-21 and as such Kato cannot anticipate the claimed invention.

As amended, Claim 17 is directed to a tool comprising a sapphire monocrystal body having at least two faces defining a sharp edge, one face formed by a working plane and a second face formed by a cleavage plane parallel to a plane R of the sapphire monocrystal, the angle between the working plane and the cleavage plane being less than about 70 degrees.

Kato et al. details a method of grinding sapphire wafers along their R plane to minimize warpage. Applicant notes that Kato is specifically directed to a sapphire wafer. Nothing in Kato suggests the desirability or usability of the ground wafers of Kato for "sapphire monocrystal body having at least two faces defining a sharp edge."

Applicant contends that the sapphire body of Kato et al. does not inherently possess the limitation that the sapphire crystal of Kato et al. does not necessarily possess "two faces defining a sharp edge, one face formed along a working plane and a second face formed along a cleavage parallel to a plane R of the sapphire monocrystal. . . the angle between the working plane and the cleavage plane being less than about 70 degrees" as required by amended Claim 17.

Regarding Figure 3 of Kato et al. to which the Examiner refers, that Figure shows a sapphire wafer with the C planes shown as diagonal lines 3. The C planes are the atomic net planes (0001) in the hexagonal crystal structure (Kato, Col. 2:17-

20). Lines 3 are merely imaginary representations of these planes. The upper left hand edge of the sapphire wafer of the figure (where the imaginary plane is extended to demonstrate the 57.6° relationship) clearly has a right angle (90°) corner. The right hand edge of the wafer might appear to follow the C plane. Because the imaginary extension of the upper left edge shows an angle of 57.6° , simple geometry tells us that the upper right hand edge of the sapphire wafer must have an angle of 122.4° (i.e., 180° minus 57.6°). As such, the requirement of amended claim 17 that the sapphire body be comprised of "two faces defining a sharp edge, one face formed along a working plane and a second face formed along a cleavage parallel to a plane R of the sapphire monocrystal. . . the angle between the working plane and the cleavage plane being less than about 70 degrees" is not necessarily present in the sapphire wafer of Kato et al. As such, Kato et al. cannot anticipate the claimed invention. Applicant believes that the presently claimed invention patentably distinguishes over Kato et al. and amended Claim 17 should be allowed.

Amended Claim 20 is limited to sapphire monocrystal plate having "a microcrack on the major face parallel to the plane R for starting to cleave the plate". Kato neither teaches nor suggests the microcrack limitation of amended claim 20. As such, Applicant believes that Amended Claim 20 patentably distinguishes over the cited prior art. Allowance of amended Claim 20 is respectfully requested.

Claim 21 depends from claim 20 and is patentable for at least the same reasons as claims 20. Withdrawal of the rejection and allowance of claim 21 is respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6810 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: October 18, 2002

By: Brian D. Martin
Brian D. Martin
Registration No. 47,771
Attorney for Applicant(s)

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701

FAX COPY RECEIVED
OCT 18 2002
TECHNOLOGY CENTER 2800

Version with markings to show changes made:

20. (Twice Amended) A sapphire monocrystal plate comprising a sapphire monocrystal having a major face, a working reference plane on a peripheral edge of the plate, the working reference plane being substantially parallel or perpendicular to a plane R of the sapphire monocrystal, and a microcrack line on the major [surface] face parallel to the plane R for starting to cleave the plate.